SIEMENS

MS/TP Point Pickup Module

Owner's Manual

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Building Technologies

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Warning

This equipment generates, uses, and can radiate radio frequency energy. If equipment is not installed and used in accordance with the instructions manual, it may cause interference to radio communications. Equipment has been tested and found to comply within the limits for a Class B digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference. Residential area equipment users are required to take whatever measures necessary to correct the interference at their own expense.

Service Statement

Control devices are combined to make a system. Each control device is mechanical in nature and all mechanical components must be regularly serviced to optimize their operation. Siemens Industry, Inc. branch offices and authorized distributors offer Technical Support Programs that will ensure continuous, trouble-free system performance.

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FCC Regulations

The manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*

- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

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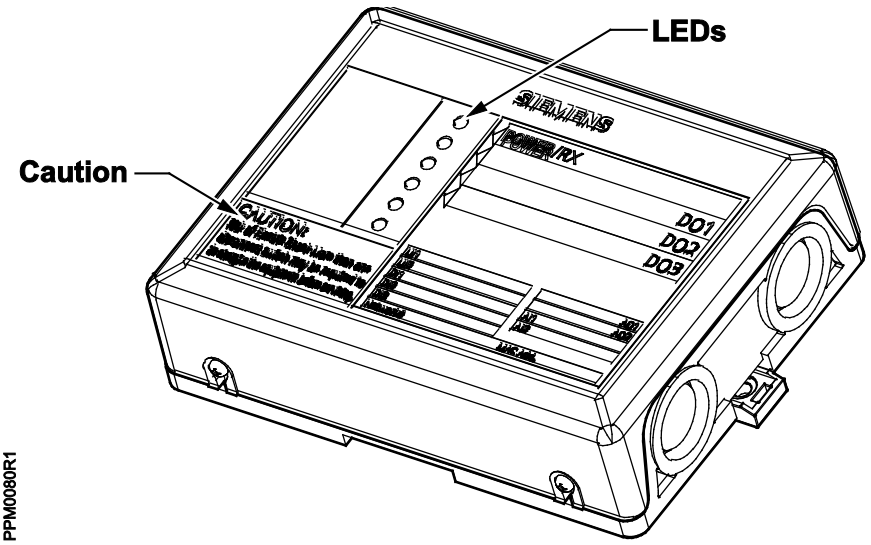
Product Overview

The Siemens MS/TP Point Pickup Module (PPM) are expansion I/O devices that communicate on a BACnet MS/TP network, allowing for the incorporation of a cluster of remote points into the Building Automation Station over the MS/TP network.

The PPM family leverages the MS/TP network to extend the reach of any BTL-listed BACnet Building Controllers application program.

Each Universal Input can be configured for analog or digital input. Input/Output type is configured by writing to BACnet object properties.



MS/TP Point Pickup Module (PPM).

Compatibility with Siemens Native BACnet and Third-party Automation Systems

MS/TP PPM devices are BTL listed as application specific controllers (ASC) and are compatible with other BTL-listed devices, including all Siemens BACnet building controllers and operator workstations. All firmware revisions of Siemens Compact and Modular BACnet building controllers support the MS/TP PPM family, and Firmware Revision 3.2.2 and later also adds support for U-COV (unsolicited change of value).

Siemens operator workstation Revision 3.11 and later provide System Profile icons representing MS/TP PPM devices. Siemens BACnet operator workstations with BOB (BACnet Object Browser , available with Rev 3.7 and later) provide the ability to modify the MS/TP PPM's custom default device ID, device name and COV increment.

NOTE:
BACnet systems consist of devices that communicate using the BACnet protocol, and are therefore interoperable with other BACnet products to a certain extent. Note that interoperability is always dependent on the implementation by the manufacturer in addition to how the device is actually applied in the field. Only commonly implemented features will work correctly. Carefully study PICS and BTL for interoperability when evaluating for use in a mixed manufacturer BACnet system.

Board Diagrams

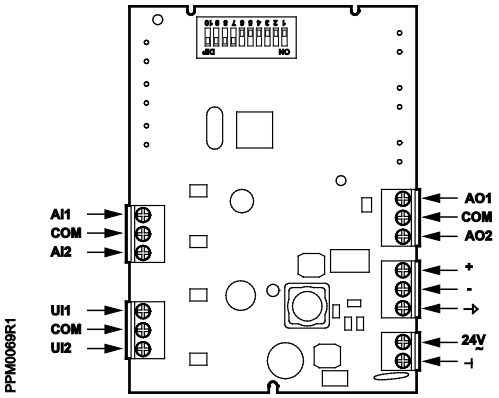


Figure 1: 6 Point Analog controller board.

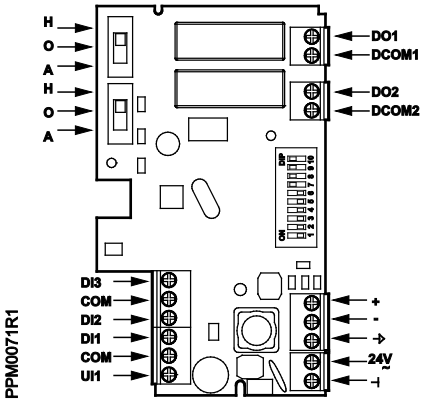


Figure 2: 6 Point Digital controller board.

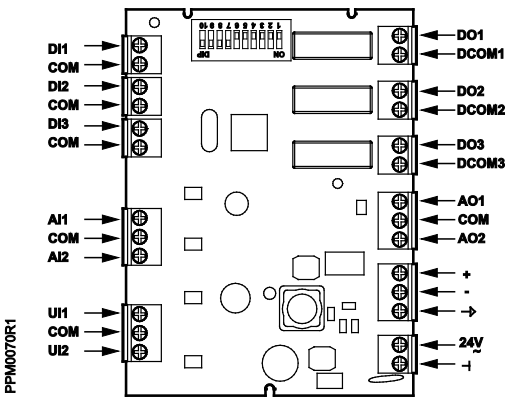


Figure 3: 12 Point Combination controller board.

Supported Sensor Types

		PPM Type		
		Digital	Analog	Combo
I/O function	Description	Maximum number of functions per module		
Digital inputs				
Binary Inputs	Status indication, voltage-free/dry contact	4	2	5
Counter	Count/accumulator, voltage-free/dry pulse contact	3		
Analog inputs w/ 12-bit A/D resolution				
	Temperature Ni 1000		4	4
	Temperature Pt 1000 385		4	4
	Temperature NTC 10K Type II	1		
	Voltage, DC 0 to 10V		4	4
	Current DC 4 to 20 mA		2	
Digital outputs				
BO OnOff	NO Contact, 240 Vac, 5A Resistive/2 A General Purpose	2		3
Analog outputs				
	DC 0 to 10V		2	2

Specifications

Dimensions and Weight

Dimensions	6.1 in. x 4.5 x 1.5 in. (154 mm x 114.4 mm x 40 mm)
Weight	0.85 lb max. including box

Communication

Communications Remote Local	BACnet MS/TP master or slave 9600 to 76800 baud set using DIP switch

Electrical

Power Requirements Operating Range Power Consumption	Input power range of 19.2 Vac to 28.8 Vac (50 or 60 Hz) 4 VA to 7 VA
Universal Inputs	**6 Point Digital PPMs (**PPM-1U32.BPR and PPM-1U32.BPF**)** 1- 10KΩ Type II NTC Thermistor or dry contact **6 Point Analog PPMs (**PPM-2U22.BPF and PPM-2U22.BPR**)** 2- 1000 Nickel RTD, 1000 Pt RTD, 0-10V, or dry contact **12 Point Combination PPMs (**PPM-2U3322.BPFand PPM-2U3322.BPR**)** 2- 1000 Nickel RTD, 1000 Pt RTD, 0-10V, or dry contact
Digital Outputs	**6 Point Digital PPMs (**PPM-1U32.BPR and PPM-1U32.BPF**)** 2- Form A NO (Normally Open) Relays. 24 to 240 Vac, 5A resistive, 2A General Purpose, 5(2) **6 Point Digital PPM (PPM-1U32.BPR)** 2- Hand-Off-Auto switches provide manual operation of the relays for commissioning **12 Point Combination PPMs (**PPM-2U3322.BPFand PPM-2U3322.BPR **)** 3- Form A NO (Normally Open) Relays. 24 to 240 Vac, 5A resistive, 2A General Purpose, 5(2)
Analog Inputs	**6 Point Analog PPMs (**PPM-2U22.BPF and PPM-2U22.BPR**)** 2- 1000 Nickel RTD, 1000 Pt RTD, 0-10 Vdc, or 4-20 mA **12 Point Combination PPMs (**PPM-2U3322.BPFand PPM-2U3322.BPR**)** 2- 1000 Nickel RTD, 1000 Pt RTD, 0-10 Vdc
Analog Outputs	**6 Point Analog PPM (**PPM-2U22.BPF and PPM-2U22.BPR**)** 2- 0-10 Vdc **12 Point Combination PPM (**PPM-2U3322.BPFand PPM-2U3322.BPR**)** 2- 0-10 Vdc
Digital Inputs	**6 Point Digital PPMs (**PPM-1U32.BPR and PPM-1U32.BPF**)** 3- Dry contact or Pulse accumulator **12 Point Combination PPMs (**PPM-2U3322.BPFand PPM-2U3322.BPR**)** 3- Dry contact

Operating Environment

Temperature Monitoring Accuracy	**6 Point Digital PPMs (**PPM-1U32.BPR and PPM-1U32.BPF**)** ±1.0°F over a range of 55°F to 95°F (13°C to 35°C) PPM-1U32.BPR and PPM-1U32.BPF **12 Point Combination PPMs (**PPM-2U3322.BPFand PPM-2U3322.BPR**)** ±1.5F over a range of 25F- 302F (-20 to 150°C) **6 Point Analog PPMs (**PPM-2U22.BPF and PPM-2U22.BPR**)** ±1.5F over a range of 25F- 302F (-20 to 150°C)
Shipping and Storage Temperature	-13°F to 158°F (-25°C to 70°C)
Operating Temperature	32°F to 122°F (0°C to 50°C)
Humidity Range	5% to 95% rh (non-condensing)

Communication (RS-485 Port)

The RS-485 port provides a path for commands and information transmitted between field panels or other BACnet devices. This port provides communications over an RS-485 BACnet MS/TP network. The communication speed is set during startup using the DIP switch.

The RS-485 port provides half-duplex, asynchronous serial RS-485 communications over shielded twisted pair cable. The communication terminations (+ – ⏚) are shown on the inside unit cover.

The PPM can reside on any BACnet building controller's sub network. Refer to other device manufacturer's PICs and BIBBs to determine interoperability. Up to 32 MS/TP devices can be supported on a BACnet/IP network*.

* The MS/TP PPM is an 1/8 load device.

HOA (Hand-Off-Auto)

Hand-Off-Auto (HOA) switches are available only for the Digital MS/TP PPM (PPM-1U32.BPR).

These switches can be used for commissioning. In the **H** position, the digital output is ON, in the **O** position the digital output is OFF. For system control the switch must be set to the **A** position.

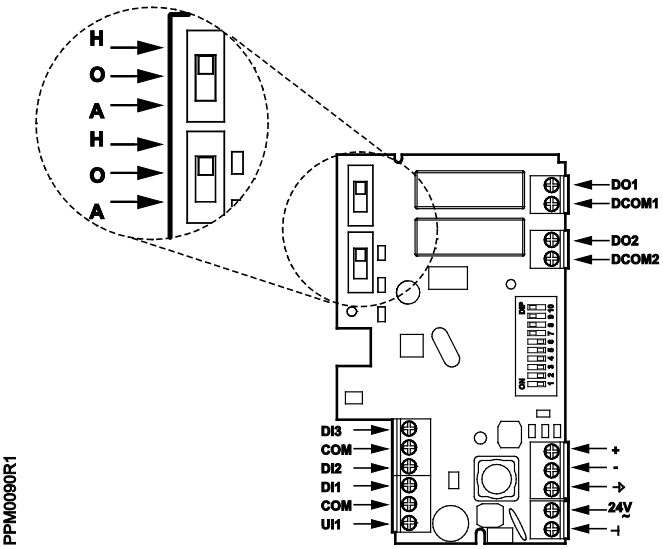


Figure 4: Hand-Off_Auto Switches (Digital Only).

DIP Switch Settings

DIP Switches 1 through 8 are used to set the MAC address. Switches 9 and 10 are used to set the communication speed (baud rate).

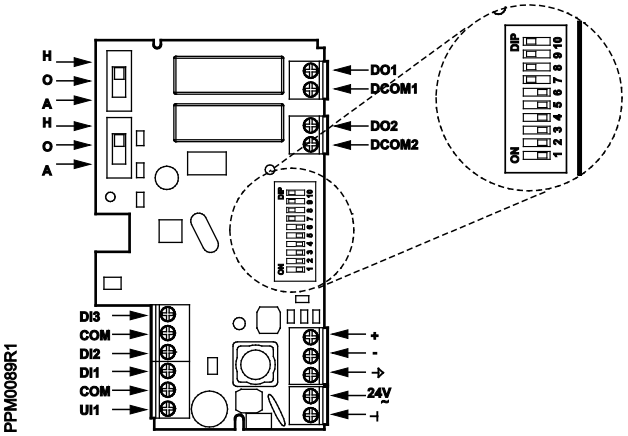


Figure 5: DIP Switches.

Baud Rate Settings

Use DIP Switches 9 and 10 to set the device's communication speed (baud rate).

Baud Rate	Switch 9	Switch 10
9600	OFF	OFF
19200	OFF	ON
38400	ON	OFF
76800	ON	ON

Status LEDs

The controller has up to four Light Emitting Diode (LED) indicators, depending on the device. A POWER/RX LED solid ON indicates that the device is powered, but no communication. A flashing LED indicates that the device is successfully transmitting packets across the network.

Controller LEDs		
LED Type	**Label**	**Indication**
DO	DO1, DO2, DO3	Indicates the ON/OFF status of the associated DO. A glowing LED indicates that the DO is energized. The 6 point digital and 12 point combination controllers have two and three DOs, respectively.
Power/Receive	POWER/RX	Indicates the power and communication status of the device. Solid ON indicates device is powered, no communication. OFF indicates unit not powered. Flashing indicates device is successfully transmitting packets on the network.

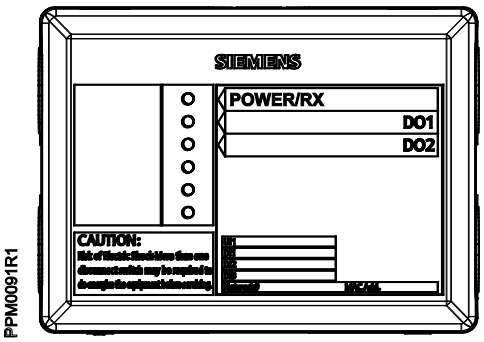


Figure 6: 6 Point Digital PPM with Two Digital Outputs.

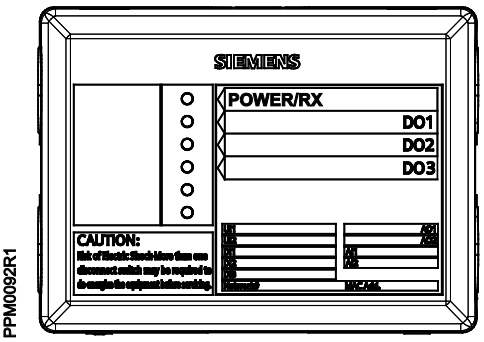


Figure 7: 12 Point Combination PPM with Three Digital Outputs.

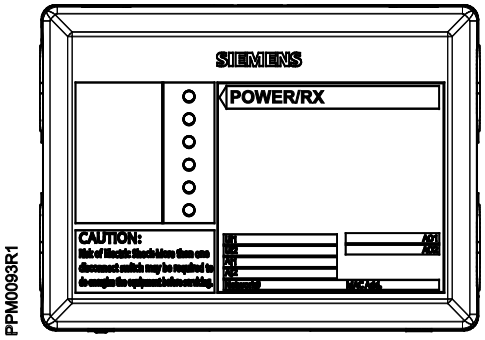


Figure 8: 6 Point Analog PPM without DOs.

Change of Value Implementation

Change of Value (COV) on the MS/TP PPM is implemented as follows:

- Broadcast only on the same network as the initiated device. (Not a global broadcast) This reduces network traffic to only the local MS/TP network in which the PPM with COV's resides.
- COVs can be turned on or off by writing to binary output 80 (Enable COV). The COV limit is user configurable over the MSTP network, and can be adjusted down for better resolution or up for less network traffic.
- Default COV limit is 0.5 for AI's and AO's; thermistor (NTC10K, Ni1000& Pt1000) 0.5F; 0-10V or 4-20 mA 1%.
- MaxInfoFrames is configurable from 1 to 15; the default is 12. This variable specifies the maximum number of information frames (COVs) the node may send before it must pass the token.

Accuracy/Resolution

Signal	Accuracy	Resolution	Range
Ni1000	32.9°F (0.5°C)	32.2°F (0.1°C)	-4 – 302°F (-20°C – 150°C)
Pt1000	32.9°F 0.5°C	32.2°F (0.1°C)	-4 – 302°F (-20°C – 150°C)
NTC10k	33.0°F(0.56°C)	32.3°F(0.14°C)	-13 –165.2°F(-25°C – 74°C)
4 to 20 mA	200uA	100uA	4 to 20 mA
0 to 10V input	100mV(1%)	50mV	0 to 10V
0 to 10V output	100mV(1%)	30mV	0 to 10V

Table 1:

Wiring

See the *Wiring Guidelines Manual* (125-3002) for additional wiring information.

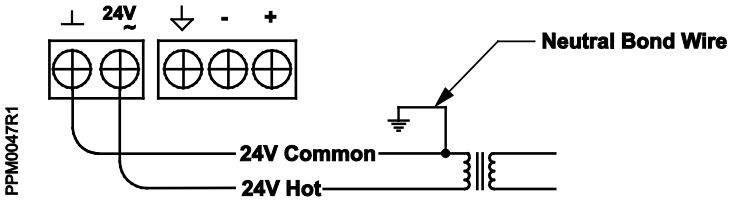


Figure 9: Power Wiring.

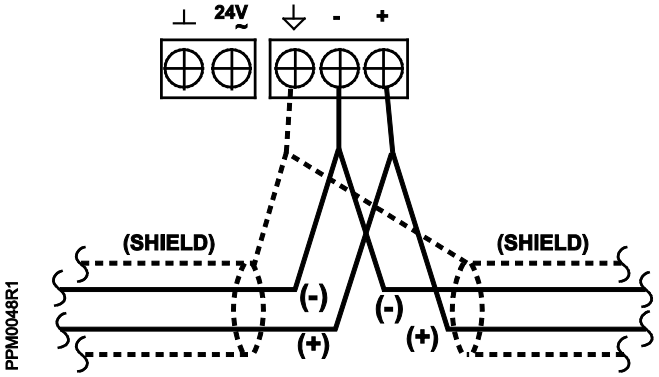


Figure 10: FLN 2-wire network interface.

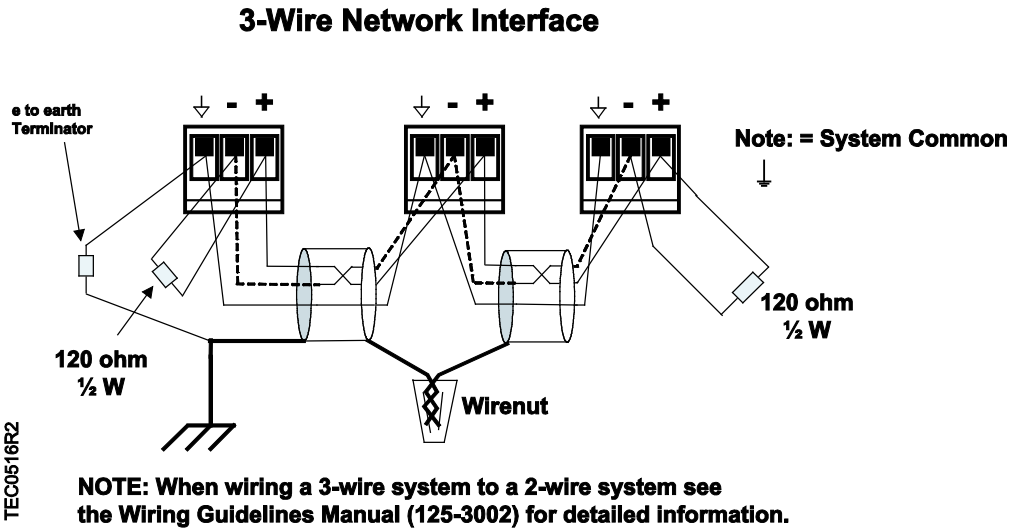


Figure 11: FLN 3-wire interface.

I/O Configuration Diagrams

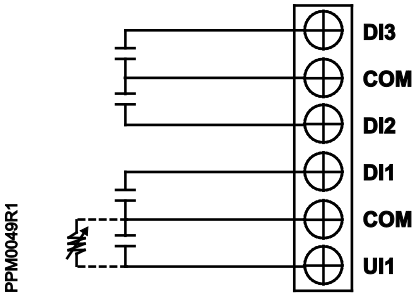


Figure 12: AI/DI wiring for 6 point digital.

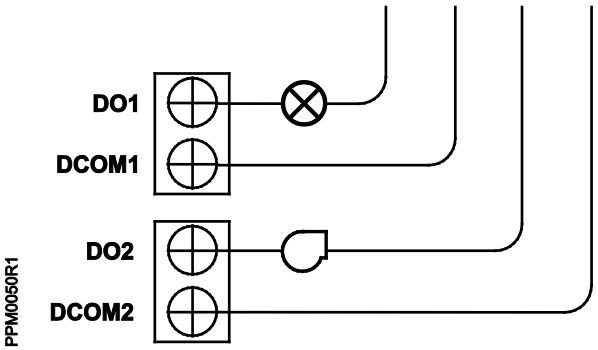


Figure 13: DO wiring for wiring for 6 point digital.

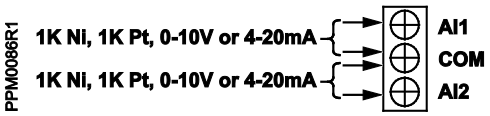


Figure 14: Analog input wiring.

Figure 15: Universal input wiring.

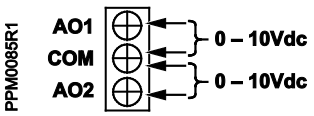


Figure 16: Analog output wiring.

Service Information

This section describes corrective measures you can take if you encounter a problem with an MS/TP PPM device. If you encounter a symptom or a problem not covered in this manual, contact your Siemens Solution Partner, Authorized TALON Dealer.

NOTE:
When removing power to a controller to perform maintenance or service, make sure that the person in charge of the facility is aware of this and that appropriate steps are taken to keep the building in control.

NOTE:
When troubleshooting, record the problem and what actions were performed immediately before the problem occurred. Being able to describe the problem in detail is important should you need assistance from your local Siemens Solution Partner, Authorized TALON Dealer.

To view the status of the MS/TP PPM device and to call up reports for troubleshooting, you can use an operator's terminal and the operator interface or a TALON View workstation. For more information, see the following documentation:

- TALON Firmware User's Manual (588-580).

It is good practice to back up the MS/TP PPM device database routinely and whenever changes are made to the database or new equipment is added.

While performing the troubleshooting procedures outlined in this manual, you may want to refer to the TALON Wiring Guidelines Manual (588-581).

Electrostatic Discharge

An electrostatic discharge (ESD) wrist strap is generally not required when installing or servicing an MS/TP PPM. However, if the device is installed in a very dry environment where a high static discharge is likely, an ESD wrist strap is recommended.

Ordering Replacement Parts

If a MS/TP PPM is not operating correctly, it should be replaced.

Reinstalling the Mounting Tabs

Do the following to reinstall a DIN mounting tab:

1. Place the wire spring clip into the pocket in the channel for the mounting tab.
2. Make sure the mounting tab is face down. Working from the center (inside) of the base, slide the mounting tab into the channel. (See the following figure.)

NOTE:
The end with the screw hole slides into the channel first.

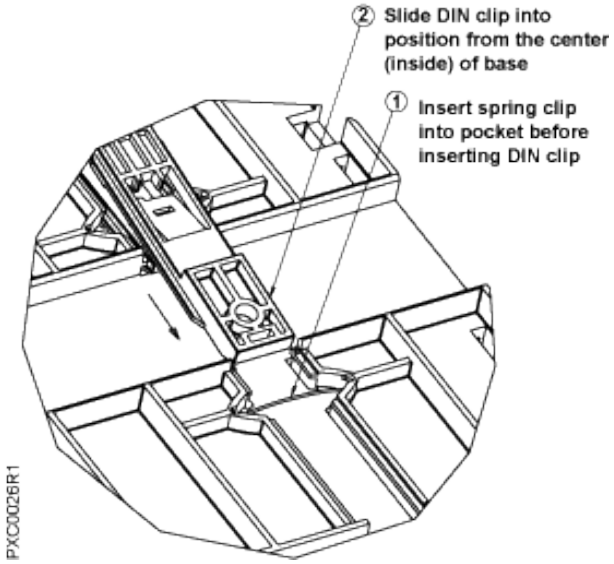


Figure 17: Reinstalling a DIN Mounting Tab.

Glossary

analog input (AI) point

Point that receives a signal that represents a condition which has more than two states. For example, flow rate sensors (water or air), temperature sensors (room or duct), pressure sensors (static or velocity), and humidity sensors (room, duct or outdoor).

analog output (AO) point

Point that sends a signal to command equipment which has more than two states. For example, damper or valve positioners, fan inlet vane controllers, motor controllers, or electric heater controllers.

BACnet

Data communication protocol for Building Automation and Control networks, ANSI/ASHRAE Standard 135-1995. BACnet allows devices from multiple manufacturers to work together.

BACnet Object Browser

An application that allows you to browse Siemens BACnet devices and objects and third-party BACnet devices and objects for diagnostic purposes.

BIBB

BACnet Interoperatibility Building Blocks. Collections of one or more BACnet services that function to define the interoperational capabilities of a BACnet device. For more information, see the Building Automation and Control Networks, ANSI/ASHRAE Standard 135-2004.

change-of-value (COV)

Point trending method where each change in a point's value, based on a pre-defined limit, is recorded.

digital input (DI) point

Point that receives a two-state signal such as ON/OFF and OPEN/CLOSE. For example, low temperature detectors, differential pressure switches, flow proof switches, and door closures.

digital output (DO) point

Point that sends a two-state signal such as ON/OFF and OPEN/CLOSE. For example, two-speed fan motor starters, two-position valves and dampers, pump motor starters, lighting switches, and chiller and boiler switches.

HAND-OFF-AUTO (HOA) switches

Manually operated control switches located on the face of HOA equipped MECs and point expansion modules that enable digital output points to be manually placed into HAND (ON), OFF, or AUTO control. Analog outputs can be placed into AUTO and nine manual control positions.

light emitting diode

(1) Solid state device that gives off light when electricity passes through it. (2) Display applications are classified either as low information content (where a limited amount of information is being displayed, refresh rates are slow, and the nature of information being displayed is predictable), or as high information content (where the opposite conditions apply). Broadly speaking LEDs, ELs, and VFDs are best suited to the former, while plasma and all types of LCDs are appropriate for the latter.

Protocol Implementation Conformance Statement (PICS)

Available from building automation control vendors, a PICS documents such things as supported conformance class, functional groups, standard application services, standard object types, data link layer options, character sets, and any special functionality built into the protocol.

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